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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,835

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Akihiro Hironaka

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EXAMINER

AUNG, SAN M

ART UNIT

PAPER NUMBER

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MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,835	Applicant(s) HIRONAKA, AKIHIRO	
	Examiner SAN AUNG	Art Unit 3657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2 is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>06/14/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This communication is a Fourth Office Action Final rejection on the merits.
Claims 1 and 2, as originally filed, are currently pending and have been considered below.

Response to Amendment

The amendment filed June 14, 2010 has been entered. No amendment has been made. Therefore, claims 1 and 2 are pending in the application.

Claim Rejections - 35 USC § 103

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (Noise and Life of Helical Timing Belt Drives), and further in view of Araki et al. (US Patent 4,840,608).

As per claim 1, Ueda et al. discloses a helically-toothed-belt transmission device for transmitting driving force by meshing between a helically-toothed belt and a helically-toothed pulley, the device being characterized in that:

when denoting a tooth pitch as "Pt", a tooth helix angle as " θ ", and a belt width of said helically-toothed belt as "W", said tooth helix angle " θ " is set in a range of

$$-0.2 \leq 1 - W \cdot \tan \theta / Pt \leq 0.75.$$

From Ueda et al. in page 274, "Forms and Dimensions of Test Belt and Pulleys", the combination of helix angle 10 degree, pitch value of 8 mm, and belt width of 20 mm, it lies between the range of -0.2 and 0.75, (that is 0.55) as recited in claim 1.

However, Ueda et al. silent about a backlash between said helically-toothed belt and said helically-toothed pulley is set to be from 1.6% to 3% of said tooth pitch "Pt".

Araki et al. discloses Toothed Belt with relation between pitch and backlash. In table 2, of Araki et al. column 1, belt with Cycloidal tooth has pitch value of 9.525 and corresponding backlash is 0.15. It is close to the Ueda et al. belt combination.

It would have been obvious to one ordinary skill in the art at the time the invention was made to modify the belt of the Ueda et al. to choose the belt and pulley combination with toothed belt and said helically-toothed pulley is set to be from 1.6% to 3% of said tooth pitch as taught by Araki et al. in order to provide low noise belt and pulley sets and get optimal performance.

Allowable Subject Matter

2. Claim 2 is allowed.

The closest prior art fails to explicitly disclose that,

$1 - W \cdot \tan \theta / Pt \leq 0$, required in claim 2. The prior art fails to disclose or suggest this limitation recited in independent claim 2.

Response to Arguments

3. Applicant's arguments filed June 14, 2010 have been fully considered but they are not persuasive.

4. In page 2 of the remarks, the applicant argued that "the Examiner points out that Araki et al. discloses backlash of 0.15 mm for a belt of pitch 9.525 mm in Table 2, column 4. The Applicant respectfully points out, that Araki does not appear to provide an unambiguous definition of "backlash," in particular failing to define whether it is based on total backlash or a half-tooth backlash as in Fig. 3 of the Applicant's specification. Without a clear definition, Araki's disclosure is not enabling".

In page 3, of the remark, the applicant argued that “Even if, for the sake of argument, Araki teaches a backlash “close” to Applicant's range, this teaching would still not support a prima facie case of obviousness because Araki teaches that a smaller backlash is better, and Applicant's range is larger” (2nd paragraph) and “not only does Araki's teaching not fall within Applicant's claimed range of backlash, regardless of definition of backlash, but also Araki teaches away from Applicant's range, teaching that an improved tooth is made with a gap “as small as possible so as to reduce backlash.” Furthermore, other problems could be mentioned” (3rd paragraph).

In response to applicant's argument the Examiner respectfully disagree. Ueda et al. discloses in Forms and dimension of Test Belt and Pulley”, the combination of helix angle 10 degree, pitch value of 8 mm, and belt width of 20 mm, and using the equation recited in claim 1, get 0.55 mm and range is lies between -02 and 0.75 as recited in claim 1.

Again Araki clearly showed in table 2, belt with Cycloidal tooth has pitch value of 9.525 and corresponding backlash is 0.15, it is close to the Ueda belt combination and since applicant did not disclose in the claim as the backlash is maximum or at half of the half-height of the tooth and also did not disclose larger backlash range is better or smaller backlash range is better.

Therefore, the rejection of claim 1, over Ueda et al. (Noise and Life of Helical Timing Belt Drives), and further in view of Araki et al. (US Patent 4,840,608) is proper and is therefore maintained the rejection.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAN AUNG whose telephone number is (571)270-5792. The examiner can normally be reached on Mon-to- Fri 7:30 am- to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on 571-272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3657

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SAN AUNG/
Examiner, Art Unit 3657

/Robert A. Siconolfi/
Supervisory Patent Examiner, Art
Unit 3657